



1. CODES AND STANDARD

- ♦ IEC : International Electrotechnical Commission
- ♦ NEC : National Electrical Code
- ♦ ANSI : American National Standards Institute
- ♦ IEEE : Institute of Electrical and Electronic Engineers
- ♦ NEMA : National Electrical Manufacturers Association
- ♦ API : American Petroleum Institute
- ♦ NFPA : National Fire Protection Association
- ♦ JEC : Japanese Electrotechnical Committee
- ♦ JEM : Japanese Electrical Manufacturers Association

2. HAZARDOUS AREA

가.

	IEC	NEC	JIS
(1000)	Zone 0	Division 1	0
(10~1000)	Zone 1		1
(0.1~10)	Zone 2	Division 2	2

1) **Zone 0** ()

- ♦ Gas Vapor 가 가
- ♦ Tank , Pipe Line Equipment

2) **Zone 1** ()

- ♦ Normal 가 가
- ♦ Maintenance, Repair 가 가

3) **Zone 2** ()

- ◆ , Emergency Condition 가 가
- ◆ , 가 가 ,
- ◆ Positive Mechanical Ventilation 가 Vapor Ventilating Equipment 가 Zone I Area Positive Pressure Ventilation , Safeguard 가 , 가 가

. GAS GROUP

Group 가 가

1) IEC Code

GROUP	Chemicals
IIA	Acetone, Ammonia, Amyl acetate, Aniline, Benzene, n-Butanol, Carbon monoxide, Cyclohexane, Cyclohexanol, Ethane, Ethanol, Ethyl acrylate, n-Heptane, n-Hexane, Hexanol, Kerosene, Methane, Methanol, Naphtha, Nitroethane, Nitromethane, n-Nonane, Propane , Styrene, Toluene, Vinyl acetate, Xylene
IIB	Acrolein, Acrylonitrile, 1,3-Butadiene, Cyclopropane, Diethyl ether, Ethylene , Ethylene oxide, Methyl acetate, Coke-oven gas
IIC	Acetylene , Carbon Disulfide, Hydrogen

2) NEC Code

- ◆ Group A : Acetylene
- ◆ Group B : Hydrogen or Manufactured Gas
- ◆ Group C : Ethyl-Ether Vapors, Ethylene
- ◆ Group D : Gasoline, Hexane, Naphtha, Benzene, Butane, Propane, Alcohol, Acetone, Benzol, Lacquer-solvent vapor, Natural gas

3. Type of Protection ()

			가 Zone
	Flameproof	d	1, 2
	Pressurization	p	1, 2
	Increased Safety	e	2
	Intrinsic Safety	ia, ib	0*, 1, 2
	Oil Immersion	o	1, 2
	Powder Filling	q	2
	Encapsulation	m	1, 2
	Special	s	1, 2

* ia : Zone 0, 1, 2 ib : Zone 1, 2 (Not Zone 0)

가

Zone 0 : Intrinsic Safety (ia)

Zone 1 : Zone 0 + Intrinsic Safety (ib), Flame-proof (d), Pressurization (p),
Oil-Immersion (o)

Zone 2 : Zone 1 + Zone 2 + Increased Safety (e)

가. (Flame-Proof, “d”)

가

가

- ◆
- ◆
- ◆ 가 가 가

(Pressurization, “p”)

(Protective Gas)

가

- ◆ (Protective Gas)
() 가

(LEL, Lower Explosion Limit)

가

Air, Nitrogen

가 가

- ◆ Alarm , (ISA-S12.4 Instrument Purging – Zone 2 Area Type Z Purge)
- (Increased Safety, “e”) Normal Arc Spark , Arc Spark , , .
- (Intrinsic Safety, “ia, ib”) IEC 79-11 Test () 가 Energy Intrinsically-safe circuit .
- ◆ 가 가 Energy 가 가 Energy .
- ◆ 가 , 가 .
- (Oil Immersion, “o”) Arc Spark 가 가 가 가 가 .

4. Temperature Classification “T”

Temperature Design -20 +40 Ambient 가

IEC 79-8 6 가 .

Temp. Class	T1	T2	T3	T4	T5	T6
Maximum Surface Temperature ()	≤ 450	≤ 300	≤ 200	≤ 135	≤ 100	≤ 85

5.

“Exd IIC T4” ,

